

# Differential Pressure Controller

## TA Series 7PR



### 1.0 PRODUCT DESCRIPTION

#### Available Sizes

- 2 ½ – 8" / 65 – 200 mm
- End types are according to ASME/ANSI B16.42 Class 150 flanges

#### Pressure Class

- Class 150 pressure rating

#### Application

- Hydronic heating and cooling systems using water and water/glycol mixtures

#### Function

- Differential pressure control to a maximum of 116 psi/800 kPa/8 bar
  - Factory preset range
    - 1 – 7 psi/10 – 50 kPa/0.1 – 0.5 bar = Blue
    - 4 – 21 psi/30 – 150 kPa/0.3 – 1.5 bar = Orange
    - 12 – 58 psi/80 – 400 kPa/0.8 – 4 bar = Grey

#### Temperature

- -4°F to +248°F/-20°C to +120°C

### 2.0 CERTIFICATION/LISTINGS

Not applicable – contact Victaulic with any questions.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

### 3.0 SPECIFICATIONS - MATERIAL

**Valve Body:** Ductile iron EN-GJS-400.

**Pilot Body:** AMETAL® DZR brass copper alloy.

**O-Rings:** EPDM rubber.

**Seat Seal:** EPDM/Stainless steel.

**Plug Mechanism:** Stainless steel and brass.

**Membrane:** EPDM rubber.

**Springs:** Stainless steel.

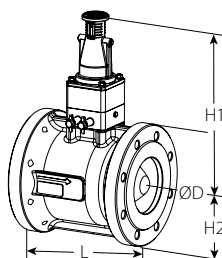
**Screws and Nuts:** Stainless steel.

**NOTE**

- AMETAL® is the dezincification resistant alloy of IMI TA.

### 4.0 DIMENSIONS

#### TA Series 7PR

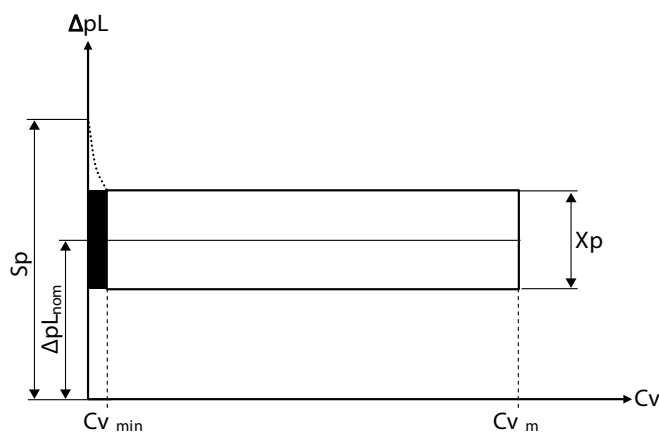


Size		Dimensions				Weight
Nominal inches DN	Actual Outside Diameter inches mm	D inches mm	L inches mm	H1 inches mm	H2 inches mm	Approximate (Each) lb kg
2½	2.875 73.0	7.09 185	7.48 190	10.70 274	3.54 93	39.7 18
3 DN80	3.500 88.9	7.52 200	7.99 203	11.10 281	3.78 100	46.3 21
4 DN100	4.500 114.3	9.02 220	9.02 229	11.90 303	4.53 110	70.5 32
5	5.563 141.3	10.00 250	10.00 254	12.30 313	5.00 125	92.6 42
6 DN150	6.625 168.3	11.00 285	10.50 267	13.00 331	5.51 143	123.5 56
8 DN200	8.625 219.1	13.50 340	11.50 292	14.20 361	6.77 170	183 83

## 5.0 PERFORMANCE

Size		Performance	
Nominal inches DN	Actual Outside Diameter inches mm	$C_{vm}$ $K_{vm}$	$q_{max}$ gpm $m^3/hr$
2½	2.875 73.0	87 75	233 53
3 DN80	3.500 88.9	127 110	343 78
4 DN100	4.500 114.3	208 180	559 127
5	5.563 141.3	312 270	841 191
6 DN150	6.625 168.3	462 400	1246 283
8 DN200	8.625 219.1	694 600	1867 424

### Working Range



$Sp$  = Sealing pressure, the increase of  $\Delta pL$  in psi when a  $\Delta p$  controller controls  $\Delta pL$  from  $Cv_{min}$  down to zero flow.

$Cv_{min}$  = gpm at a pressure drop of 1 psi and minimum opening corresponding to the p-band.

$Cv_m$  = gpm at a pressure drop of 1 psi and maximum opening corresponding to the p-band.

$q_{max}$  = The maximum recommended flow through a  $\Delta p$  controller.

$\Delta pL_{nom}$  = Middle value of  $\Delta pL$  in the p-band.

$Xp$  = The p-band in psi for  $\Delta pL$ .

$\Delta H$  = Available differential pressure.

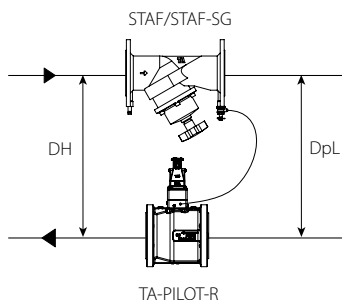
$\Delta p$  = Pressure drop across the valve.

$q$  = Actual measured flow.

Size		2½"	3" DN80	4" DN100	5"	6" DN150	8" DN200
$Sp$ [psi]	$\Delta H = 0-58$ psi	6.5					
	$\Delta H = 58-116$ psi	9.4					
$Cv_{min}$		5					
$Cv_m$		87	127	208	312	462	694
$q_{max}$ [gpm]		233	343	559	841	1246	1867

### NOTE

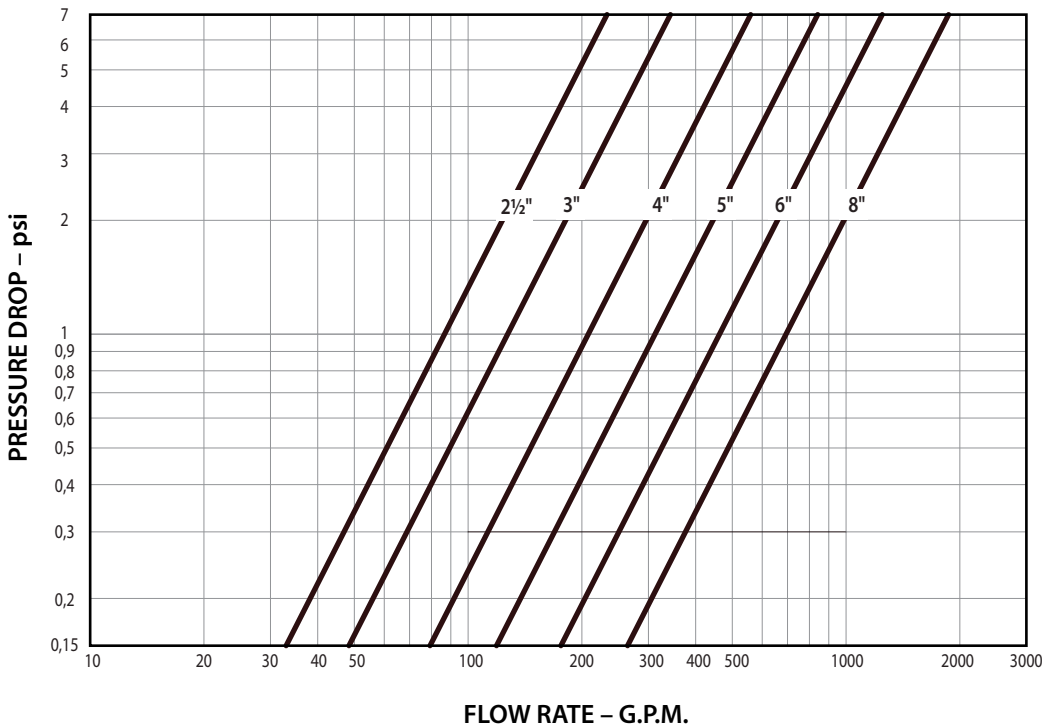
- Below  $Cv_{min}$  use expansion vessel for stable control. If  $Sp$  is within the p-band, the p-band is valid down to  $Cv = 0$ .



5.0 PERFORMANCE (Continued)

Sizing

The diagram shows the lowest pressure drop required for the TA Series 7PR valve to be within its working range at different flows.



## 5.0 PERFORMANCE (Continued)

Calculate the minimum needed available differential pressure  $\Delta H_{\min}$ .

Calculations based on various sizes may be needed.

$$\Delta H_{\min} = \Delta pV_{\text{STAF}} + \Delta pL + \Delta pV_{\min}$$

Where:  $\Delta pV_{\text{STAF}}$  is the pressure drop across the fully open upstream system valve;

$\Delta pL$  is the pressure drop across the load; and

$\Delta pV_{\min}$  is the TA Series 7PR pressure drop (as per the Sizing  $\Delta p$  vs Flow chart on page 4 of this publication).

Verify available differential pressure is greater than the sum of  $\Delta pV_{\text{STAF}} + \Delta pL + \Delta pV_{\min}$ .

Reference [publication 08.16](#): Balancing Valves if using TA Series 788 or 789 for  $\Delta pV_{\text{STAF}}$ .

In order to optimize the control function of the TA Series 7PR, select the smallest possible valve from the above calculations.

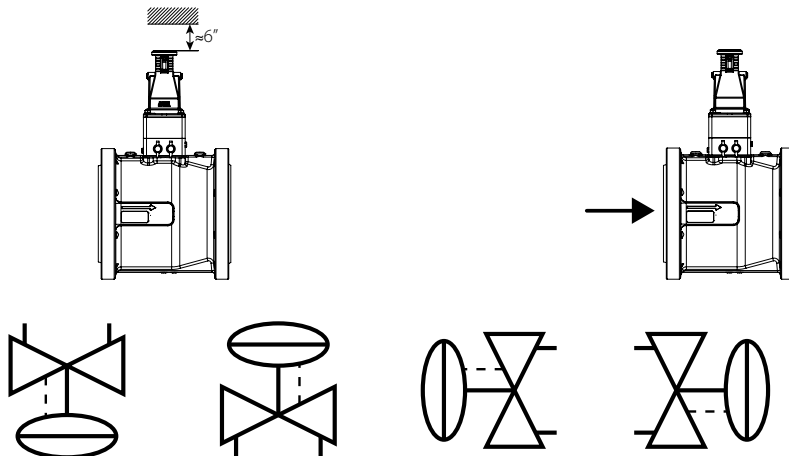
Victaulic/IMI TA recommends the software HySelect for calculating the valve size. HySelect can be downloaded from [www.imi-hydraulic.com](http://www.imi-hydraulic.com).

### Installation of Valve | Flow Direction

Installation of valve

Approx. 6 in. free space is required above the pilot.

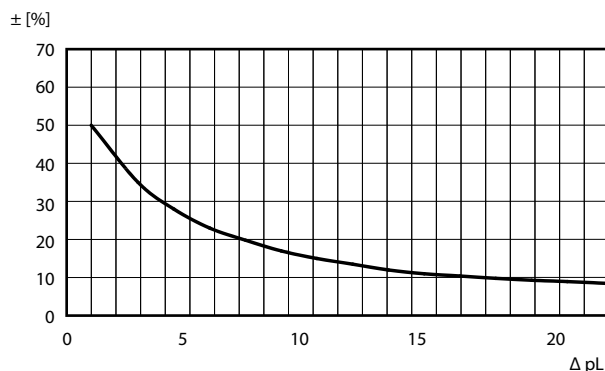
Flow direction



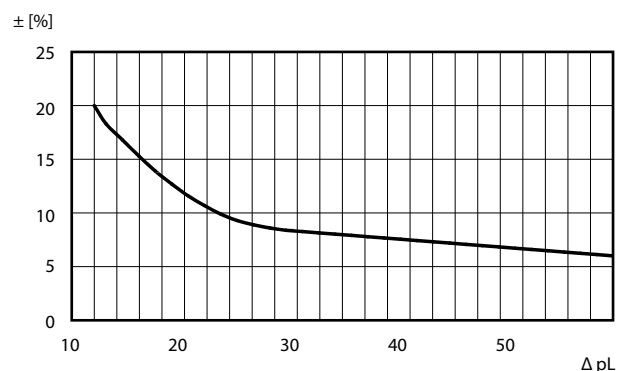
Maximum p-band in  $\pm\% \Delta pL_{\text{nom}}$

Setting Range

1 – 7 psi/4 – 21 psi



12 – 58 psi



## 5.0 PERFORMANCE (Continued)

### Setting Table

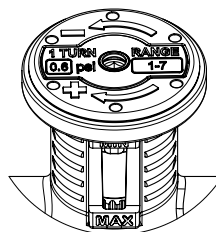
Turns		psi		
		1-7	4-21	12-58
Min	0	1 <sup>1</sup>	4 <sup>1</sup>	12 <sup>1</sup>
–	2.5	2.5	8.3	23.5
–	5	4	12.5	35
–	7.5	5.5	16.8	46.5
Max	10	7	21	58

<sup>1</sup> Delivery setting.

### psi/turn

1-7 psi	4-21 psi	12-58 psi
0.6 psi	1.7 psi	4.6 psi

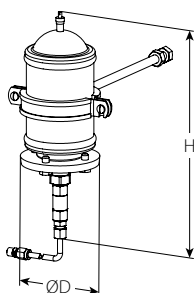
psi/turn is also marked on the top of the pilot.



### Accessories

#### Expansion Vessel

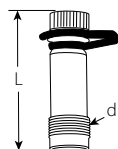
3.3 ft capillary pipe (Ø6 mm) and capillary pipe connection Ø6xR1/4 are included.  
Factory set at 43.5 psi (3 bar).



H (in)	D (in)	Part Code
10.8	3.5	P0007PR0EV

#### Measuring Point

Max +248°F/+120°C

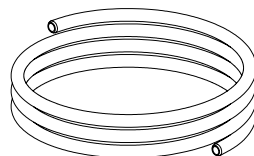


d	L (in)	Part Code
M14x1	1.7	K000740003
M14x1	4.1	K000740010

#### Capillary Pipe

Ø0.25 in

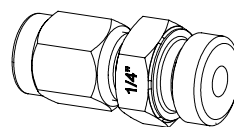
1 piece included in TA Series 7PR.



L (ft)	Part Code
3.3	P0007PR0CP

#### Capillary Pipe Connection

For capillary pipe 0.25 in with R1/4 connection.  
1 piece included in TA Series 7PR.



	Part Code
0.25" x R1/4"	P0007PR0PC

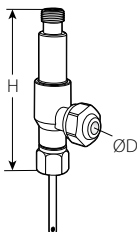
## 5.0 PERFORMANCE (Continued)

### Measuring Point, Two-Way

For connection of capillary pipe while permitting simultaneous use of IMI TA balancing instrument.

For connection to existing measuring point on Victaulic Series 788 and 789 Manual Balancing Valves.

Can be installed during operation.

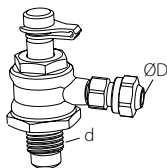


D (in)	H (in)	Part Code
0.25	2.7	P0007PRMP2

### Capillary Pipe Connection with Shut-Off

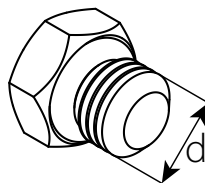
For replacement of existing measuring point on Victaulic Series 788 and 789 Manual Balancing Valves.

1 piece included in TA Series 7PR.



d	D (in)	For Size (in)	Part Code
G3/8	0.25	2½ - 8	P0007PRG39

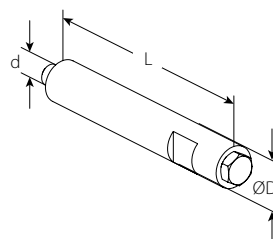
### Venting Screw



d	Part Code
M6	P0007PROVS

### Venting Extension

Suitable when insulation is used.



d	D (in)	L (in)	Part Code
M6	0.5	2.8	P0007PROVE

## 6.0 NOTIFICATIONS

Not applicable – contact Victaulic with any questions.

## 7.0 REFERENCE MATERIALS

[08.16: Victaulic Balancing Valves TA Series 786/787/788/789 and Series 78K](#)

### User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

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### Installation

Reference should always be made to the current IMI TA installation/assembly instructions for the product you are installing. For coupling and strainer installation, reference should always be made to the [I-100 Victaulic Field Installation Handbook](#) for the product you are installing. Handbooks are included with each shipment of Victaulic products for complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

### Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

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